

State of Nevada
Bureau of Mining Regulation and Reclamation

LAND APPLICATION OF PROCESS FLUIDS

December, 2000

The Bureau of Mining Regulation and Reclamation (Bureau) defines land application as a controlled discharge of a relatively large amount of process fluid to the environment in a short period of time. The authority for such an action is provided by NRS 445A.485.

Bureau approval for such an action will be based on the applicant clearly demonstrating that the discharge does not have the potential to degrade waters of the State, and will not negatively impact the proposed post-mining land use in the application area. In general, the Bureau will require the proposed application fluid to meet a WAD cyanide standard of less than or equal to 0.2 mg/l and a pH of between 6.0 and 9.0 Standard Units.

Upon the applicant successfully demonstrating the above concerns, the Bureau may issue the applicant a temporary permit. This permit is valid for not more than 180 days. In general, only one temporary permit shall be granted to a permitted operation. Should the applicant request another land application permit, or request additional time to discharge, the Bureau may require an engineering design change or a major modification to the Water Pollution Control Permit.

The application for land application should contain and/or discuss the following:

1. The fee for a temporary permit is \$250. This fee is non-refundable. The Bureau will not act on the request until this fee is received.
2. The applicant must clearly establish pre-existing (that is, before the permitted mining activity became active at that site) background environmental conditions in the area of the proposed application. This pre-existing background information should include at least the following:
 - a. The location of any surface waters which may be impacted to include water quality and quantity;
 - b. The depth to ground water and ground water quality;
 - c. A discussion of the overall geology and soil morphology of the site; and
 - d. A description of the vegetative community in the land application area.
3. Submit a detailed, appropriately scaled plan map showing:

- a. The area(s) to receive the discharge;
- b. The layout of solution lines, sprinklers, leachfield, etc, that will be part of the application system. The operator may propose a surface or subsurface application method. (As a note, a Professional Engineers' (State of Nevada) stamp on drawings, schematics, as-builts, etc, may be required on the proposed application system depending on the complexity of the system and proposed duration of the discharge).

4. The operator will need to clearly demonstrate that the proposed application of process fluid will not degrade waters of the state and will not negatively impact the proposed post-mining land use. Although there may be different methods of arriving at this conclusion, the Bureau will require, as a minimum, the following information:

- a. A discussion of the process fluid chemistry. How much fluid will be discharged ? Identify those constituents that have the potential to degrade the environment. The Bureau may require sampling of the process fluid before, during, and after the land application.
- b. A mass balance discussion (amount of fluid multiplied by the concentration of constituents).
- c. A soil toxicity discussion. Will the process fluid chemistry degrade the soil, impacting the proposed post-mining land use ? How will vegetation be impacted? Should vegetation/soils become negatively impacted, the operator will be required to remediate.
- d. A discussion of the process fluid 'plume' as it moves through the environment. The Bureau will consider fate transport and soil attenuation studies, column testing, and modeling. However, these studies are only approximations. The Bureau will require some type of verification of the model, for example, installation of monitoring wells, lysimeters, or any other acceptable method of providing empirical data.

5. Submit a schedule clearly defining the time periods (frequency and duration) during which discharge will occur, as well as estimated total volumes to be discharged during a given application period. For instance:

- What will the application method consist of ?
- Will the application occur for 24 hours/day, 8 hours/day, only during daylight hours, etc.?
- How many consecutive days will the application occur for a given discharge session ? Will the application be continuous until the discharge is complete ?
- Indicate what the estimated maximum daily quantity of fluid application will be, e.g., "... will not exceed [xxx] gallons per day" based on application period.
- How will application rates be monitored ? If gaging stations are to be used, indicate such. For instance, "... gaging stations will be set up on a 200 x 200 ft. grid to monitor the application rate. These gaging stations will be used to monitor the rate of process fluid to

the discharge area. The daily accumulation of solution to each gaging area will be recorded and the data reported in the final report."

6. Notify the Bureau 48 hours prior to commencement of land surface discharge.
7. Accurate records shall be kept of the total volume of solution applied per day and the area it is applied to. For example: document which pond (preg or barren) is being pumped and the duration of time that pumping occurs; the total volume of fluid pumped/ discharged per pond per discharge session. The application area shall be clearly delineated on the ground (for example, metal fence posts at the corners). Photographs will be required of the application area vegetation both before the application and for several years following completion of the application. These requirements will be incorporated into the Water Pollution Control Permit monitoring requirements.
8. Land application of the process fluid will cease during precipitation events.
9. Land application of process fluid will cease if any surface runoff occurs or is anticipated; or if any significant deviation from the submitted plan occurs or is reasonably anticipated.
10. Update the Bureau monthly on the progress of the land application activity.
11. Following termination of the land application activity, within 30 days submit a brief but thorough summary of those activities, including:
 - Total fluid volumes applied;
 - Changes from activities and methodologies originally proposed for land application;
 - Gaging station data by day;
 - Daily pond level, if applicable.